AMENDMENTS TO THE CLAIMS

1-108. (Canceled)

109. (New) An apparatus for determining one or more physical properties of a rolled smoking article or filter rod, said apparatus comprising:

an imaging device defining a field of view, said imaging device imaging a rolled smoking article or filter rod in said field of view;

a positioning unit which positions a smoking article or filter rod in said field of view such that the axis of the smoking article or filter rod is substantially orthogonal to the optical axis of the imaging device;

an illuminating unit which illuminates said field of view;

a rotating mechanism which rotates said smoking article or filter rod about its axis in said field of view; and

a processor which processes said image to determine one or more physical properties of a smoking article or filter rod in said field of view;

wherein said processor repeatedly samples said image as said smoking article or filter rod is rotated by said rotating mechanism to obtain a plurality of image samples;

wherein the processor processes each image sample to obtain a measurement of a diameter of said rolled smoking article or filter rod in each image sample; and

wherein the processor uses said measurements to obtain one or more physical properties of said rolled smoking article or filter rod selected from the mean diameter,

ovality, circumference, roundness and shape of said rolled smoking article or filter rod.

110. (New) Apparatus as claimed in claim 109, wherein said imaging device forms a digital image of said smoking article or filter rod.

111. (New) Apparatus as claimed in claim 110, wherein said processor processes said digital image electronically for determining said one or more physical properties.

112. (New) Apparatus as claimed in claim 109, wherein said illuminating unit casts diffuse light onto said field of view.

113. (New) Apparatus as claimed in claim 109, wherein said imaging device defines an optical viewing axis and said illuminating unit comprises one or more sidelights which are positioned laterally of said optical axis.

114. (New) Apparatus as claimed in claim 113, wherein said illuminating unit comprises two sidelights positioned on opposite sides of said optical axis.

115. (New) Apparatus as claimed in claim 109, wherein said illuminating unit comprises a backlight which backlights a smoking article or filter rod positioned in said field of view.

116. (New) Apparatus as claimed in claim 115, wherein said backlight comprises an infra-red light.

117. (New) Apparatus as claimed in claim 109, wherein said imaging device comprises a digital camera.

118. (New) Apparatus as claimed in claim 109, wherein said rotating mechanism comprises two juxtaposed rollers, which rollers are positioned side-by-side so as to define a groove therebetween which groove receives said smoking article or filter rod, and a rotating unit which rotates one or both of said rollers thereby to cause said smoking article or filter rod to rotate.

119. (New) Apparatus as claimed in claim 109, wherein said processor locates in each image sample two opposite edges of the rolled smoking article or filter rod in profile and calculates the distance between said opposite edges.

120. (New) Apparatus as claimed in claim 119, further comprising a control unit which controls said processor, said control unit comprising a database, which database is adapted to store a predetermined nominal diameter of said rolled smoking article or filter rod, said control unit defining two laterally spaced regions of interest of said field of view corresponding to the nominal width, each of which regions of interest encompasses all likely positions of a respective one of the opposite edges, and said control unit being

configured to control the processor to process each image sample only within said two regions of interest to locate said opposite edges.

121. (New) Apparatus as claimed in claim 109, wherein said processor determines the diameter of said rolled smoking article or filter rod at two or more axially spaced locations on said rolled smoking article or filter rod.

122. (New) Apparatus as claimed in claim 109, wherein said processor detects one or more circumferential markers on a rolled smoking article or filter rod which are capable of indicating its rotational orientation.

123. (New) Apparatus as claimed in claim 118, further comprising a control unit which controls said rotating unit in response to output from the processor such that said rolled smoking article or filter rod is rotated through a complete revolution.

124. (New) Apparatus as claimed in claim 109, further comprising a control unit which controls said processor, said control unit comprising a database which stores data indicating the axial direction of a rolled smoking article which is axially asymmetric such that said rolled smoking article is directional, said processor repeatedly sampling said image as said rolled smoking article is rotated by said rotating mechanism, and processing each sample to detect the position of a shadow cast by a longitudinal seam of an outer layer of the rolled smoking article, said outer layer being wrapped circumferentially around said rolled smoking article to overlap itself thereby to form said

seam, thereby to determine the direction of wrapping of said outer layer relative to the direction of the rolled smoking article.

125. (New) Apparatus as claimed in claim 124, wherein said database stores a nominal width of said rolled smoking article, and said control unit derives two laterally spaced regions of interest of said field of view based on said nominal width, each of said regions of interest encompassing all likely positions of said shadow depending on the direction of wrapping of said outer later, and controls said processor to detect the presence of said shadow only in one of said regions of interest.

126. (New) Apparatus as claimed in claim 124, wherein said illuminating unit comprises sidelights positioned obliquely relative to the optical axis to enhance the shadow cast by said seam.

127. (New) Apparatus as claimed in claim 124, wherein said processor determines the respective wrapping directions of two or more outer layers of a rolled smoking article, each of which outer layers is wrapped circumferentially around the rolled smoking article to overlap itself to form an axially extending seam.

128. (New) A method of determining one or more physical properties of a rolled smoking article or filter rod, said method comprising:

disposing a rolled smoking article or filter rod within a field of view of an imaging means such that the axis of the smoking article or filter rod is substantially orthogonal to the optical axis of the imaging means;

illuminating said field of view;

imaging said rolled smoking article or filter rod within said field of view to form a digital image;

rotating said smoking article or filter rod about its axis in said field of view;

repeatedly sampling said image as said smoking article or filter rod is rotated to obtain a plurality of image samples;

electronically processing each image sample to obtain a measurement of a diameter of said rolled smoking article or filter rod in each image sample; and

electronically processing said measurements to obtain one or more physical properties of said rolled smoking article or filter rod selected from the mean diameter, ovality, circumference, roundness and shape of said rolled smoking article or filter rod.

129. (New) A method as claimed in claim 128, including illuminating said field of view with diffuse light and using light reflected from said rolled smoking article or filter rod to form said image.

130. (New) A method as claimed in claim 128, including determining the diameter of the rolled smoking article or filter rod in each image sample by processing the image sample to locate the two opposite edges of the rolled smoking article or filter rod in profile and calculating the distance between said opposite edges.

131. (New) A method as claimed in claim 130, including processing each image sample within two predetermined, laterally spaced regions of interest of said field of view to locate said two opposite edges, which regions of interest are determined on the basis of the nominal diameter of the rolled smoking article or filter rod.

132. (New) A method as claimed in claim 128, wherein the diameter of said rolled smoking article or filter rod is measured at two or more axially spaced locations on said rolled smoking article or filter rod.

133. (New) A method as claimed in claim 128, wherein said rolled smoking article or filter rod comprises one or more circumferential markers adapted to indicate the rotational orientation of the rolled smoking article or filter rod, the method including processing said samples to determine a complete revolution of the rolled smoking article or filter rod.

134. (New) A method as claimed in claim 128, including determining an axial direction of a rolled smoking article which is axially asymmetric such that said rolled smoking article is directional and comprises at least one outer layer which is wrapped circumferentially around said rolled smoking article to overlap itself thereby to form a longitudinal seam, and processing said image samples to determine the wrapping direction of said outer layer relative to the direction of said rolled smoking article.

135. (New) A method as claimed in claim 134, wherein said image samples are processed to determine the position of said longitudinal seam by detecting the position of a shadow cast by said seam as the rolled smoking article rotates.

136. (New) A method as claimed in claim 135, including processing each image sample to detect the presence of said shadow in two predetermined, laterally spaced regions of interest being determinative of the direction of wrapping of the outer layer, the regions of interest being determined on the basis of a predetermined nominal width of the rolled smoking article.

137. (New) A method as claimed in claim 135, including illuminating said rolled smoking article obliquely to enhance the shadow cast by said seam.

138. (New) A method as claimed in claim 135, wherein said rolled smoking article comprises two or more outer layers, each of which outer layers is wrapped circumferentially around the rolled smoking article to overlap itself to form an axially extending seam, and said image is processed to determine the wrapping direction of each outer layer relative to the direction of the rolled smoking article.

139. (New) An apparatus for determining one or more physical properties of a rolled smoking article or filter rod, said apparatus comprising:

imaging means defining a field of view, said imaging means imaging a rolled smoking article or filter rod in said field of view;

means for positioning a smoking article or filter rod in said field of view such that the axis of the smoking article or filter rod is substantially orthogonal to the optical axis of the imaging means;

illuminating means for illuminating said field of view; and

processing means for processing said image to determine one or more physical properties of a smoking article or filter rod in said field of view;

wherein the processing means determines one or more physical properties of the smoking article or filter rod which relate to the diameter of the smoking article or filter rod.

140. (New) Apparatus as claimed in claim 139, wherein said illuminating means casts diffuse light onto said field of view.

141. (New) Apparatus as claimed in claim 139, wherein said imaging means defines an optical viewing axis and said illuminating means comprises one or more sidelights which are positioned laterally of said optical axis.

142. (New) Apparatus as claimed in claim 141, wherein said illuminating means comprises two sidelights positioned on opposite sides of said optical axis.

143. (New) Apparatus as claimed in claim 139, further comprising rotating means for rotating a smoking article or filter rod about its axis in said field of view.

144. (New) Apparatus as claimed in claim 143, wherein said rotating means comprises two juxtaposed rollers, which rollers are positioned side-by-side so as to define a groove therebetween which groove receives said smoking article or filter rod, and means for rotating one or both of said rollers thereby to cause said smoking article or filter rod to rotate.

145. (New) Apparatus as claimed in claim 143, wherein said processing means repeatedly samples the image as said rolled smoking article or filter rod is rotated by said rotating means to obtain a plurality of image samples, processes each image sample to obtain a measurement of a diameter of said rolled smoking article or filter rod in each image sample, and processes said measurements to obtain one or more physical properties of said rolled smoking article or filter rod selected from the mean diameter, ovality, circumference, roundness and shape of said rolled smoking article or filter rod.